Welcome to Part Three of the ADOT Stormwater Best Management Practices (BMP) Implementation Tutorial

This presentation complements the ADOT Erosion and Pollution Control Manual for Highway Design and Construction (EPCM). It focuses primarily on **HOW** to implement stormwater BMPs on a construction site. Prior knowledge and experience with ADOT Stormwater BMPs and the EPCM will enhance understanding of the material presented in this tutorial.

2012

Stormwater BMP Implementation Tutorial Part 3 of 3

The ADOT Stormwater BMP Implementation Tutorial is covered in three presentations. This tutorial is **Part Three** of Three.

Part One

- BMP & SWPPP Overview and Strategies
- BMP Selection
- Principles of Implementing BMPs:
  - Construction Site Planning & Management BMPs
  - Erosion Control BMPs

Part Two

- Principles of Implementing BMPs:
  - Runoff Control BMPs
  - Sediment Control BMPs

Part Three

- Principles of Implementing BMPs:
  - Good Housekeeping BMPs
  - Non-Stormwater BMPs
  - Waste Management BMPs

Tutorial Usage

The self-paced presentation is designed for individual use or for small group presentations where discussion can be accommodated. It is helpful to have the EPCM as a reference when viewing the tutorial.

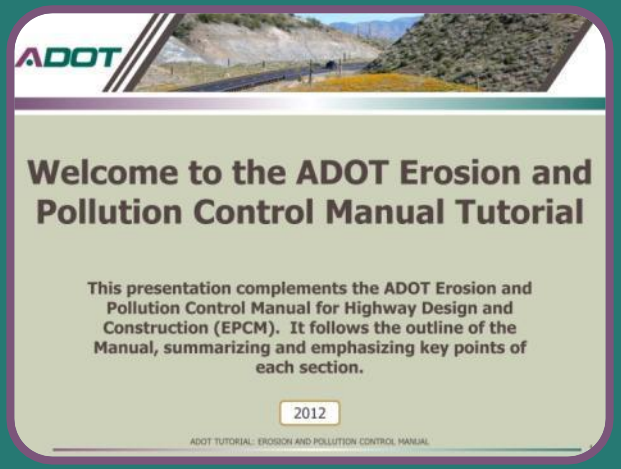
Navigating the tutorial:
Click once to advance from slide to slide.

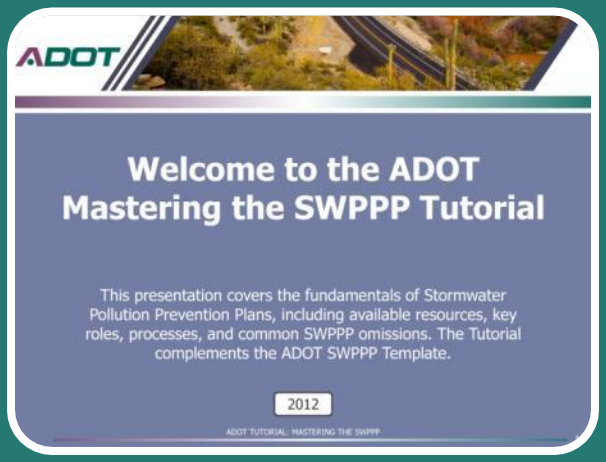
ADOT Stormwater Tutorials

Stormwater Tutorials available via the ADOT Roadside Development Section website include:

- ADOT Erosion and Pollution Control Manual
- Mastering the SWPPP
- Stormwater Best Management Practices Implementation

http://www.azdot.gov/Highways/Roadway_Engineering/Roadside_Development/Resources.asp





Best Management Practices

BMP categories (covered in Parts 1, 2, and 3 of this Tutorial)

- Construction Site Planning and Management (*covered in Part 1 of this tutorial)*
- Erosion Control, 1st line of defense (*covered in Part 1 of this tutorial)*
  - Purpose is to keep soil in place, minimizing suspension and transport.
  - Primary means of preventing stormwater pollution, implemented at beginning of construction and during construction as needed.
- Runoff & Sediment Control, 2nd line of defense (*covered in Part 2 of this tutorial)*
  - Use in conjunction with properly designed and installed Erosion Control BMPs.
- **Good Housekeeping, Non-Stormwater and Waste Management Principles**
  - Day to day operations on a construction site to manage erosion and pollution control. These BMPs are implemented throughout the construction process.

GH Good Housekeeping BMPs

Implemented throughout the construction process

Good Housekeeping BMPs

GH-1: Vehicle and Equipment Cleaning

GH-2: Vehicle and Equipment Fueling

GH-3: Vehicle and Equipment Maintenance

GH-4: Street Sweeping and Vacuuming

GH-5: Material Delivery and Storage

GH-6: Material Use

GH-7: Stockpile Management

GH-8: Spill Prevention and Control

GH-9: Portable Toilet

GH-1 Vehicle and Equipment Cleaning

Practices must be consistent with AZ Aquifer Protection Permit requirements

Definition

Procedures and practices used to clean vehicles and equipment prior to or during use on a project site.

Implementation

1. Size washout pit to retain all wash and rinse water from vehicle cleaning operations.
2. Verify that personnel are following proper procedures and practices.
3. Comply with all federal, state and local requirements.

GH-2 Vehicle and Equipment Fueling

Fuel vehicles off-site whenever practical

Definition

Procedures and practices to minimize or eliminate fuel spills and leaks during fueling.

Implementation

1. Protect fueling areas with berms and/or dikes to prevent runon, runoff and to contain spills.
2. Locate fueling areas at least 50 feet from downstream drainage facilities or watercourses.
3. Verify that personnel are following proper procedures and practices.
4. Comply with all federal, state and local requirements.

GH-3 Vehicle and Equipment Maintenance

Implement when heavy equipment /maintenance yards are located on site

Definition

A program of equipment maintenance procedures and practices for the construction site.

Implementation

1. Plan for the proper recycling or disposal of used oils, hydraulic fluids, gear lubricants, batteries, and tires.
2. Locate equipment maintenance and wash-out areas at least 50 feet from drainage facilities.
3. Provide spill containment areas around stored oil and chemical drums.
4. Comply with local codes and ordinances regarding the disposal of fluids and consumable goods.

GH-4 Street Sweeping and Vacuuming

Plan for proper disposal of sweeper waste

Definition

Practices to remove sediment tracked from project site onto public or private paved roads.

Implementation

1. Remove tracked sediment before it becomes wet, sticky or compacted and do not place sediment in ADOT right-of-way.
2. Consider incorporating the removed sediment that is debris-free back into the project.
3. Comply with all local regulations.

GH-5 Material Delivery and Storage

Ensure that an accurate inventory is kept for all material stored on-site.

Definition

Procedures and practices for the proper handling, delivery and storage of construction materials at the construction site.

Implementation

1. Use covered storage for materials that are potential stormwater contaminants.
2. Consider the location of storage areas and allow for sufficient separation between stored containers.
3. Comply with federal, state and local requirements, including building and fire codes for storage sheds.
4. Inspect containers and storage areas for spills and damage.

GH-6 Material Use

Personnel training is critical to ensure proper material handling

Definition

Using construction material in a manner that minimizes or eliminates the discharge of these materials to the storm drain system or watercourse.

Implementation

1. Comply with federal, state and local requirements, including building and fire codes for storage sheds.
2. Use recycled and less hazardous products when practical.
3. Maintain logs for all pesticides applied.
4. Be prepared with ample spill clean up material near use areas

GH-7 Stockpile Management

Applicable to all projects that stockpile soil, paving, and other materials

Definition

Procedures and practices to reduce or eliminate stormwater contact with construction site stockpiles.

Implementation

1. Consider the location of stockpiles; keep at least 50 feet away from stormwater flows, drainage courses and inlets.
2. Implement additional protection measures if rain is predicted.
3. Implement wind erosion control practices as appropriate.

GH-8 Spill Prevention and Control

Required for all construction activities

Definition

Procedures and practices implemented to prevent and control spills.

Implementation

1. Prepare and implement a spill prevention and control plan for the specific materials used or stored on site. Update plan as necessary.
2. Facilitate employee education programs.
3. Verify weekly that spill control clean up materials are properly located.

GH-9 Portable Toilet

Outhouse tipping is no laughing matter

Definition

Procedures and practices implemented to prevent the discharge of construction site sanitary/septic waste to the storm drain system or to receiving waters.

Implementation

1. Locate sanitary facilities in convenient, level locations in areas that will not collect water.
2. Stake or weight portable toilet in place.
3. Schedule regular waste collection by a licensed service.
4. Inspect regularly for leaks and spills.

NS Non-Stormwater BMPs

Source control measures designed to limit / reduce pollution

Non-Stormwater BMPs

NS-1: Water Conservation Practices

NS-2: Dewatering Operations

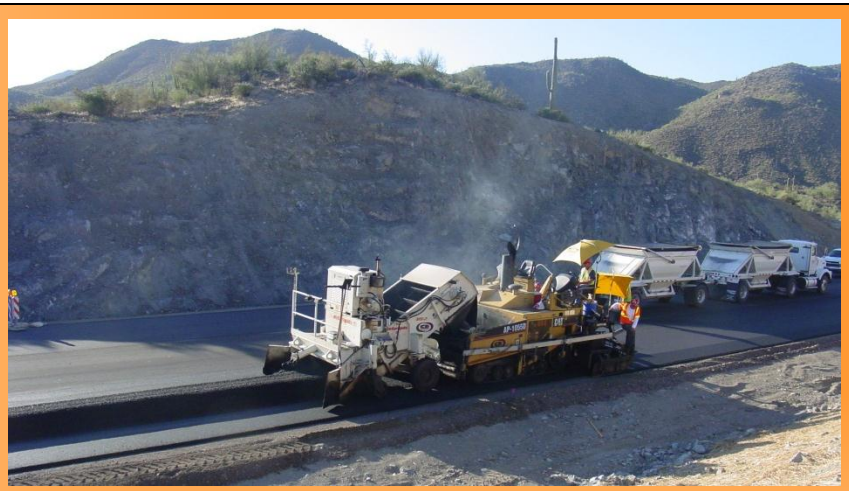
NS-3: Paving and Milling Operations

NS-4: Temporary Watercourse Crossing

NS-5: Water Diversion

NS-6: Structure Demolition/Removal Over or Adjacent to Water

NS-7: Material and Equipment Use In/ Over Watercourses



NS-1 Water Conservation Practices

Conserve a critical resource and help eliminate non-stormwater discharges

Definition

Procedures and practices that use water during construction in a manner to minimize erosion and the transport of pollutants.

Implementation

1. Avoid using water to clean construction areas.
2. Direct construction water to areas where it can infiltrate the ground or be collected and reused.
3. Regularly inspect and repair water delivery equipment and systems for leaks.

NS-2 Dewatering Operations

Implement dewatering pollution controls if contaminated water is present

Definition

Practices that manage the discharge of pollutants (sediment) when accumulated precipitation (stormwater) and non-stormwater must be removed from a work location and or construction site.

Implementation

1. Design and use is dictated by site conditions.
2. Ensure dewatering discharges do not cause erosion at discharge point.
3. Comply with regional and watershed-specific discharge requirements.

NS-3 Paving and Milling Operations

Minimize pollutants by regularly inspecting and maintaining equipment

Definition

Procedures implemented during paving surfacing, resurfacing or saw-cutting to prevent pollutants from entering stormwater systems or watercourses.

Implementation

1. Proper cleaning of vehicles and equipment.
2. Properly dispose of paving and milling debris.
3. Capture sawcutting water and dispose of per approved disposal process.
4. Watch the weather forecast – apply sealers and coatings during dry weather.
5. Cover drainage inlet structures and manholes with filter fabric during application of sealers and coatings.

NS-4 Temporary Watercourse Crossing

Consider alternative access routes where possible

Definition

A structure placed across a waterway that allows vehicles to cross the waterway during construction.

Implementation

1. Locate where erosion potential is low.
2. Consider storm event-generated runoff.
3. Requires knowledge of watercourse flows and soil strength.
4. Construct during dry periods at or near the natural elevation of the watercourse.
5. Minimize the disturbance or removal of vegetation.

NS-5 Water Diversion

Diversion ditches, berms, dikes, slope drains, and interceptor swales are commonly used diversion structures

Definition

A system of structures and measures that intercept clear surface water runoff upstream of a project site, transport it around the site, and discharge it downstream with minimal water quality degradation for either the project construction operations or the construction of the diversion.

Implementation

1. Design to accommodate fluctuations in water depth or flow volume.
2. Minimize disturbance or removal of existing vegetation.
3. Schedule construction during periods of low flow or when stream is dry.
4. Provide for velocity dissipation at transitions in the diversion.
5. Secure appropriate permits before beginning work.

NS-6 Structure Demolition / Removal Over or Adjacent to Water

Applies to all projects with full or partial structure demolition or removal

Definition

Procedures to protect watercourses from debris and wastes associated with structure demolition or removal operations over or adjacent to them.

Implementation

1. Acquire applicable permits prior to structure demolition or removal.
2. Use attachments on construction equipment to catch debris from small demolition operations.
3. Use covers or platforms approved by the Engineer to collect debris.
4. Plan for and ensure the safe passage of wildlife during and after construction.
5. Demolition of structures triggers National Emission Standard for Hazardous Air Pollutants (NESHAPS).

NS-7 Material and Equipment Use In / Over Watercourses

Rocking the boat is OK - tipping it over is not

Definition

Procedures for the proper use, storage and disposal of materials and equipment on barges, boats, temporary construction pads, or similar locations.

Implementation

1. Acquire and comply with all applicable permits.
2. Use drip pans and absorbent materials for equipment and vehicles.
3. Secure materials to prevent wind-caused discharges.
4. Ensure an adequate supply of spill cleanup materials is available.

WM Waste Management BMPs

Source control BMPs that involve keeping a clean, orderly construction site

Waste Management BMPs

WM-1: Solid Waste Management

WM-2: Hazardous Waste Management

WM-3: Contaminated Soil Management

WM-4: Concrete Waste Management

WM-5: Liquid Waste Management

WM-1 Solid Waste Management

Use to control a major cause of pollution on construction sites

Definition

Practices to use to minimize and prevent waste associated with construction activities from entering storm drains and watercourses.

Implementation

1. Plan the frequency of disposal to avoid accumulation.
2. Place on-site facilities in accessible and convenient locations for ease of maintenance.
3. Coordinate disposal of debris and domestic garbage with local jurisdiction.
4. Locate storage areas at least 50 feet from drainages.
5. Divert storm water away from stored solid waste.

WM-2 Hazardous Waste Management

Foresight can help prevent environmental investigations/enforcement actions

Definition

The planning and practice to meet the requirements for handling hazardous waste materials on a construction site.

Implementation

1. Comply with all federal, state and local laws.
2. Educate employees and subcontractors on storage and disposal.
3. Post guidelines clearly on site.
4. Maintain records of storage, handling and disposal of hazardous materials.
5. Locate storage areas away from storm drains or watercourses.

WM-3 Contaminated Soil Management

Make sure to identify contaminated soils in the project planning stage

Definition

Procedures and practices to minimize or eliminate the discharges of pollutants to the drainage system or to watercourses from contaminated soil.

Implementation

1. Complete a safety training program covering the potential hazards.
2. Educate employees and subcontractors in identification of contaminated soils.
3. Incorporate disposal procedures into regular project meetings.

WM-4 Concrete Waste Management

Plan for multiple washout facilities on sites with extensive concrete work

Definition

Methods and procedures for the management of concrete waste including concrete slurry, mortar mixing stations and on-site concrete washout facilities.

Implementation

1. Locate facilities a minimum of 50 feet from storm drains, ditches or watercourses.
2. Locate near pour site.
3. Educate employees, subcontractors and suppliers on proper techniques.
4. Follow state Aquifer Protection Program laws.

WM-5 Liquid Waste Management

Know the difference between non-hazardous and hazardous liquid waste

Definition

Procedures and practices to prevent discharge of pollutants to the storm drain system or to watercourses as a result of the creation, collection and disposal of non-hazardous liquid wastes.

Implementation

1. Comply with all local laws and regulations.
2. Educate employees and subcontractors on liquid waste generating activities and disposal procedures.
3. Contain liquid wastes in a controlled area.

BMP Strategies

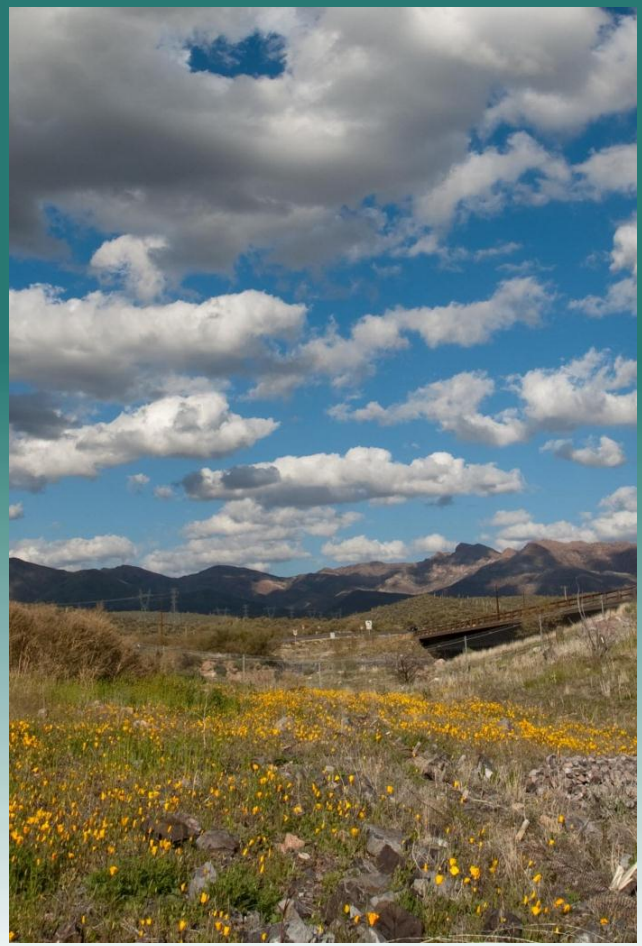
Remember these BMP Implementation Strategies to Maximize Effectiveness

- Use multiple types of BMPs in combination with one another to be most effective.
- Progressively size BMPs down the watershed.
- Limit the amount of disturbed area on site at any one time.
- Achieve final stabilization of disturbed areas as the project progresses.

Knowledge Check

Do you…

- Understand the purpose and intent of the ADOT stormwater BMPs in fulfilling the requirements of water quality regulations?
- Know how to select BMPs specific to the project?
- Have familiarity with the BMP categories and understand the optimal implementation sequence on a project?
- Understand the importance of using combinations of BMPs for the most effective stormwater pollution prevention?
- Know how to implement BMPs on the construction project site?



ADOT Stormwater Tutorials

Watch more, Learn more…

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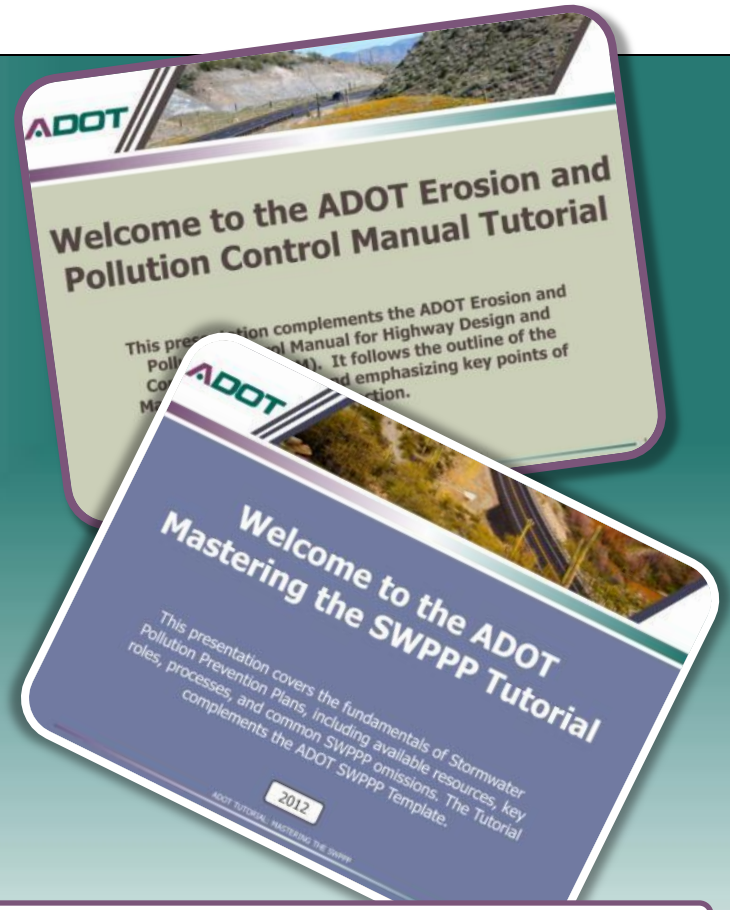

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BMP Smart

A BMP a day keeps the sediment and erosion control doctor away

Thank you for viewing **Part 3** of the Stormwater Best Management Practices Implementation Tutorial. Contact ADOT Roadway Engineering Group, Roadside Development Section, with comments or questions regarding material contained in this presentation.